

What is claimed is:

1 1. An ion implantation apparatus, comprising:
2 an ion source;
3 a mass-analysis magnet for ion beam extracted from
4 the ion source;
5 an accelerator accelerating or decelerating the ion
6 beam; and
7 an ion implantation chamber including a work piece
8 support moving one or more work pieces through
9 the ion beam; and
10 a plurality of first collectors removably disposed
11 on an interior surface of the ion implantation
12 chamber, each comprising a first surface with a
13 plurality of parallel saw-toothed first
14 protrusions to fix contaminant particles in the
15 ion implantation chamber.

1 2. The ion implantation apparatus as claimed in
2 claim 1, further comprising:

3 a Faraday cup in the ion implantation chamber,
4 disposed behind the work piece support in the
5 emission direction of the ion beam to measure
6 the current of the ion beam;

7 wherein the first collectors are mounted on the
8 interior surface of the ion implantation
9 chamber with the first surface facing the
10 Faraday cup.

1 3. The ion implantation apparatus as claimed in
2 claim 2, wherein first collectors are grounded.

1 4. The ion implantation apparatus as claimed in
2 claim 4, further comprising:

3 a connecting housing between the accelerator and the
4 ion implantation chamber, having an ion beam
5 neutralization element and a plurality of
6 second collectors, removably mounted on the
7 interior surface of the housing, each
8 comprising a second surface with a plurality of
9 parallel saw-toothed second protrusions to fix
10 contaminant particles in the housing.

1 5. The ion implantation apparatus as claimed in
2 claim 4, wherein the second collectors are grounded,
3 forming a bias voltage in the connecting housing with the
4 ion beam neutralization element.

1 6. The ion implantation apparatus as claimed in
2 claim 4, wherein each of the first protrusions has a
3 first toothed surface and a second toothed surface with a
4 first included angle, each of the second protrusions has
5 a third toothed surface and a fourth toothed surface with
6 a second included angle, and the first and second
7 included angles are between 45 and 70°.

1 7. The ion implantation apparatus as claimed in
2 claim 6, wherein the first toothed surface of each first
3 protrusion is perpendicular to the first surface of each
4 first collector.

1 8. The ion implantation apparatus as claimed in
2 claim 6, wherein the third toothed surface of each second

3 protrusion is perpendicular to the second surface of each
4 second collector.

5 9. The ion implantation apparatus as claimed in
claim 6, wherein the first and second collectors are
graphite.

1 10. An ion implantation apparatus, comprising:
2 an ion source;
3 a mass-analysis magnet for an ion beam extracted
4 from the ion source;
5 an accelerator accelerating or decelerating the ion
6 beam; and
7 an ion implantation chamber including a work piece
8 support moving one or more work pieces through
9 the ion beam;
10 a connecting housing between the accelerator and the
11 ion implantation chamber having an ion beam
12 neutralization element;
13 a plurality of second collectors removably mounted
14 on an interior surface of the housing, wherein
15 each second collector has a second surface with
16 a plurality of parallel saw-toothed second
17 protrusions to fix contaminant particles in the
18 housing.

1 11. The ion implantation apparatus as claimed in
2 claim 10, wherein the second collectors are grounded,
3 forming a bias voltage in the connecting housing with the
4 ion beam neutralization element.

1 12. The ion implantation apparatus as claimed in
2 claim 10, wherein each of the second protrusions has a
3 third toothed surface and a fourth toothed surface with a
4 second included angle, and the second included angle is
5 between 45 and 70°.

1 13. The ion implantation apparatus as claimed in
2 claim 12, wherein the third toothed surface of each
3 second protrusion is perpendicular to the second surface
4 of each second collector.

1 14. The ion implantation apparatus as claimed in
2 claim 10, wherein the second collectors are graphite.